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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,854	09/30/2005	Zenon Lysenko	63104A	6166
109 7590 07/23/2008 The Dow Chemical Company Intellectual Property Section P.O. Box 1967 Midland, MI 48641-1967				
EXAMINER				
CUTLIF, YATE KAI RENE				
ART UNIT		PAPER NUMBER		
1621				
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07/23/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/551,854

**Applicant(s)**

LYSENKO ET AL.

**Examiner**

YATE' K. CUTLIFF

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 April 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 18 - 35 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 18-35 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 30 April 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date 4/30/2008  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_  
5) ☐ Notice of Inventor's Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of Claims***

1. Claims 18-35 are pending.  
Claims 18-35 are rejected.

### ***Specification***

2. The Amendment to the specification in the Amendment filed April 30, 2008 is acknowledged and entered.

### ***Response to Amendment***

3. The Amendment filed on April 30, 2008 has an error in the header. The header list the U.S Application Number as 01/551,854, the correct application number is 10/551,854.

Appropriate correction is required.

### ***Response to Arguments***

4. Applicant's arguments, see Amendment, filed April 30, 2008, with respect to the rejection of claims 18-34 under 35 U.S.C. 103(a) as being unpatentable over Frankel, E. (US 3,787,459), Abatjoglou et al. (US 4,731,486) and Bahrmann et al. (CA 2,162,083) have been fully considered and are persuasive because of the arguments relating to Abatjogou et al. (US 4 731 486). Therefore, the rejection has been withdrawn. However, upon further consideration and even with the Examiner's withdrawal of Abatjogou et al as a reference, a new ground(s) of rejection is made in view of Frankel (US 3,787,459), Bahrmann et al. (CA 2,162,083), and Khoe et al. (Journal of the American Oil Chemists' Society, 1972).

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5. It is noted that new claim 35 was added to disclose that the hydroxymethyl-substituted fatty acid esters can be derived from C1-15 alkanols.

Applicant is directed to the discussion below.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of

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35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 18-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frankel (US 3,787,459) in view of Bahmann et al. (CA 2,162,083), and further in view of Khoe et al. (Journal of the American Oil Chemists' Society, 1972).

10. Rejected claims 18-25 and 35 cover, inter alia, an alcohol composition comprising a mixture of hydroxymethyl-substituted fatty acids or fatty acid esters comprising in terms of hydroxy distribution from greater than about 10 to less than about 95 percent mono alcohol, from greater than about 1 to less than about 65 percent diol, and from greater than about 0.1 to less than about 10 percent triol by weight, based on the total weight of the composition, and further having a diol to triol weight ratio of greater than 5/1. Dependent claims further limit the fatty acids or fatty acid esters; the diol to triol ratio; the purity of the composition; the hydroxy distribution and process of making.

11. Rejected claims 26-34 cover, inter alia, the process for preparing an alcohol composition comprising the terms of the hydroxy distribution from greater than about 10 to less than about 95 percent mono alcohol, from greater than about 1 to less than about 65 percent diol, and from greater than about 0.1 to less than about 10 percent triol by weight, based on the total weight of the composition, and further having a diol to triol weight ratio of greater than 5/1. The process involving hydroformylation of the fatty acids or fatty acid esters to form aldehydes using organophosphine metal salt ligand catalyst; separation of

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the aldehyde products; and hydrogenation of the aldehyde products to form their corresponding hydroxymethyl-substituted fatty acids or fatty acid esters.

12. Frankel discloses a process of preparing hydroxymethyl-substituted fatty acids or fatty acid esters from any fatty compound (seed oil) containing unsaturation by a) a hydroformylation process that uses rhodium-supported catalyst in the presence of a triphenylphosphine salt ligand catalyst to convert the oil to monoformyl and diformyl fatty acid or fatty acid ester, b) separating the hydroformylated oil produced in step a; c) hydrogenating the hydroformylated oil of step b in the presence of a conventional Raney nickel catalyst to produce the corresponding hydroxy methyl fatty acid or fatty acid ester with other impurities. Lastly, the process is used in Example 2 producing 90% 90.5 5 monoformyl that was subjected to hydrogenation to form the corresponding hydroxy-substituted fatty acid ester. (see Example 2).

Frankel discloses that the process produces a mixture of hydroxymethyl-substituted fatty acids or fatty acid esters, but, fails to disclose the following: the various hydroxy distribution for mono alcohol, diol and triol, and the diol to trio ratio of greater than 5/1 or 8/1; the use of monosulfonated tertiary organophosphine and the number of carbon atoms of the alcohols used in the transesterification process to make the fatty acid esters of the alcohol composition.

However, Bahrmann et al. discloses a similar process that uses esters of natural oils (seed oil) in hydroformylation to produce monoformyl, diformyl and triformyl fatty acid esters in the presence of rhodium phosphine ligand complex

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that contain at least one sulfonated radical. (see page 3, lines 10 - 36). Further, Bahrmann et al. discusses the experimental procedures which include the process of first making the diformyl and triformyl derivatives of the fatty acid esters, and then subjecting the hydroformylation products to hydrogenation using Raney nickel catalyst **to give the corresponding hydroxymethyl compounds**. Bahrmann et al. the feed stock in the process are esters that have as their other components saturated monoalcohol having from 1 to 10 carbon atoms. This fact implies that the alcohols used in transesterification process to make the starting esters of Bahrmann's, were alcohols that had from C1 to C10 carbon atoms in the molecule. Further, Bahrmann et al. discloses in Example 6 hydroformylation reactions products, based on the ester mixture, in a ratio of 39% monoformyl, 17% diformyl and 5% triformyl. As such, according to their stated process the hydrogenation of this hydroformylation mixture would produce the corresponding hydroxymethyl mixture of 39% mono alcohol, 17% diol and 5% triol.

Examiner notes that Applicant in their April 30, 2008 amendment, argues that the Bahrmann was not a valid reference because it did not illustrate any working examples nor did it characterized the Applicant's alcohol product. Applicant is reminded that a reference is not required to provide a working example. Additionally, Applicant's claimed composition is a mixture of hydroxymethyl-substituted fatty acids or fatty acid esters with a claimed hydroxy distribution, which is based on the distribution of the hydroxymethyl functional groups along the fatty acid ester formed by hydrogenation of the hydroformylation product. Therefore, Bahrmann et al. does characterize the

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claimed product in that the hydroformylation reaction of Example 6, having a ratio of 39% monoformyl, 17% diformyl and 5% triformyl, can be converted to hydroxymethyl-substituted fatty acid esters mixture having a hydroxy distribution ratio of 39% mono alcohol, 17% diol and 5% triol according to the process of Bahrmann et al., and once converted the ratios overlaps with the Applicant's claimed ratios.

However, Bahrmann et al. fails to disclose the diol to triol ratio greater than 5/1 or greater than 8/1.

For this reason, Examiner includes Khoe et al. which disclose the process for forming rigid urethane foam using the hydroformylation with rhodium-triphenyl phosphine followed by hydrogenation using Raney nickel catalyst. Applicant has argued that the composition will be used downstream to produce flexible foams and that the diol to triol ratio of 5/1 produces unexpected results. However, Khoe et al teaches that it is known in the art to change parameters of diol to triol changes the parameters of the foam. Applicant is directed to Tables I and II. Table I discloses the hydroxymethylated products, specifically samples 3, 4 and 5. When these samples are compared, after they have been used to prepare foams, Table II shows that the parameters of the foams change when the diol to triol ratios are changed. Even though Applicant's claimed ratios are not disclosed in Khoe et al., Khoe disclose that diol to triol ratio changes affect the properties of the foam. Therefore, it would be within the purview of the skilled artisan desiring to make flexible foam to change the diol to triol ratio.



It would have been obvious to one of ordinary skill in the art to produce an alcohol which is a hydroxymethyl-substituted fatty acid or fatty acid ester as suggested by Frankel, and produce one that had a varied hydroxy distribution as suggested by Bahrmann et al. and Khoe et al. to achieve the claimed invention. As disclosed in Khoe et al. the motivation for the combination would be to make foam with different parameters.

Therefore, the invention as a whole was *prima facie* obvious because a person of ordinary skill in the art at the time the invention was made, would have been motivated to combine the prior art to achieve the claimed invention and that there would have been a reasonable expectation of success.

***Declaration Under 37 C.F. R. 1.132***

13. The declarations under 37 CFR 1.132 filed April 30, 2008 is insufficient to overcome the rejection of claims 18-34 based upon 35 U.S.C. 103(a) as set forth in the last Office action because: the comparison charts provided for the Examiner's consideration has the following defects.

The foams prepared are not a side by side comparison. Applicant, in the first (revised) Declaration, Table 3 compared linseed oil to soy polyol using V-3137, D-8264, DC5160 and a water amount of 4.5. In the second Declaration, Table # 3 starts with sunflower oil and uses NIAXL-703, NIAX A-1 and a water amount of 3.0. The properties that can be slightly compared are those of CE-5 of Table 3 of the first Declaration and Examples 2, 3 and 4 of the second Declaration. However, it is known in the foam making art that altering a single variable, such as a foam component or a process condition will affect the

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interplay which exists between the different variables. Even though Applicant's second Declaration results are within the scope of the claims, because of the use of different components, Applicant has offered non-comparative examples for the Examiner to consider. In reviewing those parameters that can be considered such as resiliency %, which is a very important property of flexible foams, there does not appear to be any major difference, only an expected trend is shown. In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of nonobviousness fails to outweigh the evidence of obviousness.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YATE' K. CUTLIFF whose telephone number is (571)272-9067. The examiner can normally be reached on M-TH 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler can be reached on (571) 272 - 0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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